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(56) Documents cited

GB 1318937 A GB 1225152 A

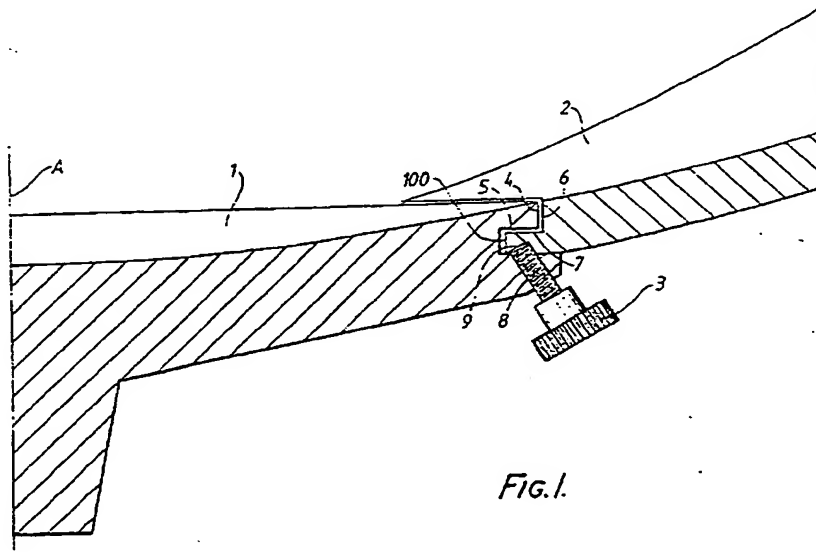
(58) Field of search

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(54) **Segmented antenna dish**

(57) A segmented antenna dish has a hub (1) and a plurality of segments (2) releasably locatable by reference faces (6), (7) their radially inner edges against reference faces (4), (5) of a rebate (100) in the periphery of the hub (1), each segment having a reaction face (9) at an acute angle to reference face (5). The hub (1) has for each segment a manually operable bolt (3) for applying a force substantially normally to the reaction face (9) for clamping releasably the reference faces (6), (7) of the segment against the reference faces (4), (5) of the rebate (100).



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy

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Segmented Antenna Dish

This invention relates to an antenna dish and to a hub forming part of such a dish.

It has been proposed to produce an antenna dish comprising a hub and a plurality of identical, radially-disposed dish segments. These segments would be releasably secured to the hub by locating pegs and sockets at each hub-segment interface and also between edges of adjacent segments near the periphery of the dish. One major problem with this proposal is the difficulty of ensuring that the segments are all accurately and securely in place, relative to the hub and relative to each other, especially since there are many degrees of freedom in their relative movement.

Accordingly, the invention provides a segmented dish structure having a hub and at least two radially-disposable segments releasably locatable by their radially inner edges against a reference face of a rebate in the periphery of the hub, the reference face extending generally radially of the hub, each segment having a reaction face, facing outwards from the hub in use at an acute angle to the reference face, the hub having means for clamping releasably a reference face of each segment against the hub reference face by applying a force substantially normally to the reaction face.

The invention also provides a hub for an antenna dish, for supporting at least two dish segments locatable by their radially inner edges against a reference face of a rebate in the periphery of the hub, the reference face extending generally radially of the hub, each segment having a reaction face, facing outwards from the hub in use at an acute angle to the reference face, the hub having means for clamping releasably a reference face of each segment against the hub reference face by applying a force substantially normally to the reaction face. A specific embodiment of the invention will now be described by way of example with reference to the accompanying schematic drawings in which:-

Figure 1 is a partial radial section through an antenna dish, illustrating a segment clamped to a hub by means of a clamping bolt; and

Figure 2 is a plan view of the convex or rear face of the assembled antenna dish of Figure 1.

The antenna dish comprises a hub 1 and eight identical segments 2, which are sectors of an annulus when viewed along the antenna axis, as in Figure 2.

The hub 1 has a channel-shaped peripheral rebate 100 which is shaped to allow easy insertion of the segments 2 and which provides mutually perpendicular reference faces 4 and 5 against which corresponding faces 6, 7 on the radially inner edge of each segment are removably

locatable. Reference face 4 is cylindrical and centred on the axis A of the antenna. Reference faces 5 and 7 are annular. At each of eight equally-spaced peripheral stations, a manually-operable clamping bolt 3 is provided, in threaded engagement with an internally-threaded bore 8 through the hub 1. The end of each bolt 3 projects into the rebate 100 to abut, substantially normally to, an annular reaction face 9 which itself is at an acute angle to the reference face 5. This clamping bolt 3 is inclined so that in use, when tightened, it exerts a force, radial and axial components of which tighten the segment faces 6, 7 against reference faces 4 and 5 respectively.

Each segment 2 has, near the periphery of the dish in use, a locating peg 10 projecting from one radial edge, and a corresponding elongate socket 11 recessed into the other radial edge at the same radius. The socket 11 is elongate to allow sufficient play in the radial direction between adjacent segments during assembly.

Each segment also has a quick-release azimuthal clamp 12 for securing corners of adjacent segments together at the dish periphery.

The dish is assembled firstly by locating the eight segments 2 at approximately their correct positions in the hub 1, so that the structure is held together by the engagement of the inner edges of the segments in the rebate 100 and by the mutual engagement of pins 10 and

sockets 11. The segments are positioned so that each one is symmetrically disposed about a clamping bolt 3. Successive clamping bolts 3 are then tightened, drawing the segments 2 together by relative sliding motion, and drawing them into precise positions against the hub 1. Finally, the peripheral clamps 12 are secured, to provide extra rigidity.

The dish is readily disassembled by reversing the assembly steps described above.

CLAIMS

1. A segmented antenna dish having a hub and at least two radially-disposable segments releasably locatable by their radially inner edges against a reference face of a rebate in the periphery of the hub, the reference face extending generally radially of the hub, each segment having a reaction face, facing outwards from the hub in use at an acute angle to the reference face, the hub having means for clamping releasably a reference face of each segment against the hub reference face by applying a force substantially normally to the reaction face.
2. A hub for an antenna dish, for supporting at least two dish segments locatable by their radially inner edges against a reference face of a rebate in the periphery of the hub, the reference face extending generally radially of the hub, each segment having a reaction face, facing outwards from the hub in use at an acute angle to the reference face, the hub having means for clamping releasably a reference face of each segment against the hub reference face by applying a force substantially normally to the reaction face.
3. An antenna dish as claimed in Claim 1, or a hub as claimed in claim 2, in which the means for clamping releasably each segment is a manually-operable action member carried by the hub and moveable relative to the hub in a direction normal to the reaction face.
4. An antenna dish or hub as claimed in claim 3 in which

the reaction member comprises a bolt in threaded engagement in a bore through the hub, the bore extending normally to the reaction face when the segment is in position against the hub.

5. A hub substantially as described herein with reference to the accompanying drawing.

6. A dish substantially as described herein with reference to the accompanying drawing.

7. A method of assembly substantially as described herein with reference to the accompanying drawing.

CLAIMS

1. A segmented antenna dish comprising: a hub having a radially outwardly opening channel therearound; a plurality of dish segments each having an end adapted to locate in the channel and to provide a reaction face; and a plurality of threaded bores extending through the wall of the channel, each at an oblique angle to the channel and each having a threaded bolt rotatable therein such that the bolt engages a reaction face on a respective one of the segments so as to urge the end of the segment into engagement with a wall of the channel.
2. A segmented antenna dish as claimed in Claim 1 in which the threaded bores extend normally to the reaction face when the segment is in position against the hub.
3. An antenna dish substantially as described herein with reference to the drawing.

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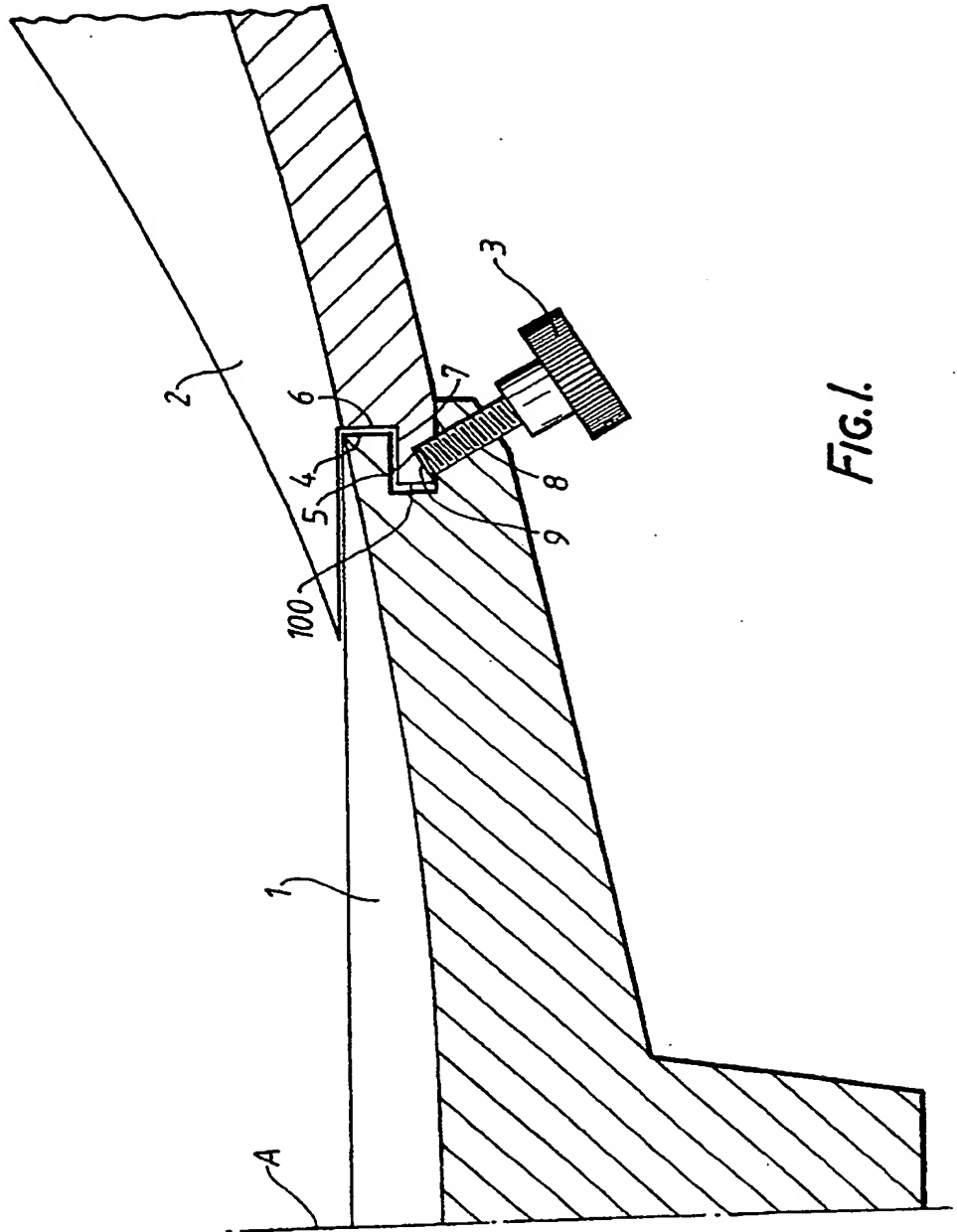


FIG. 1.

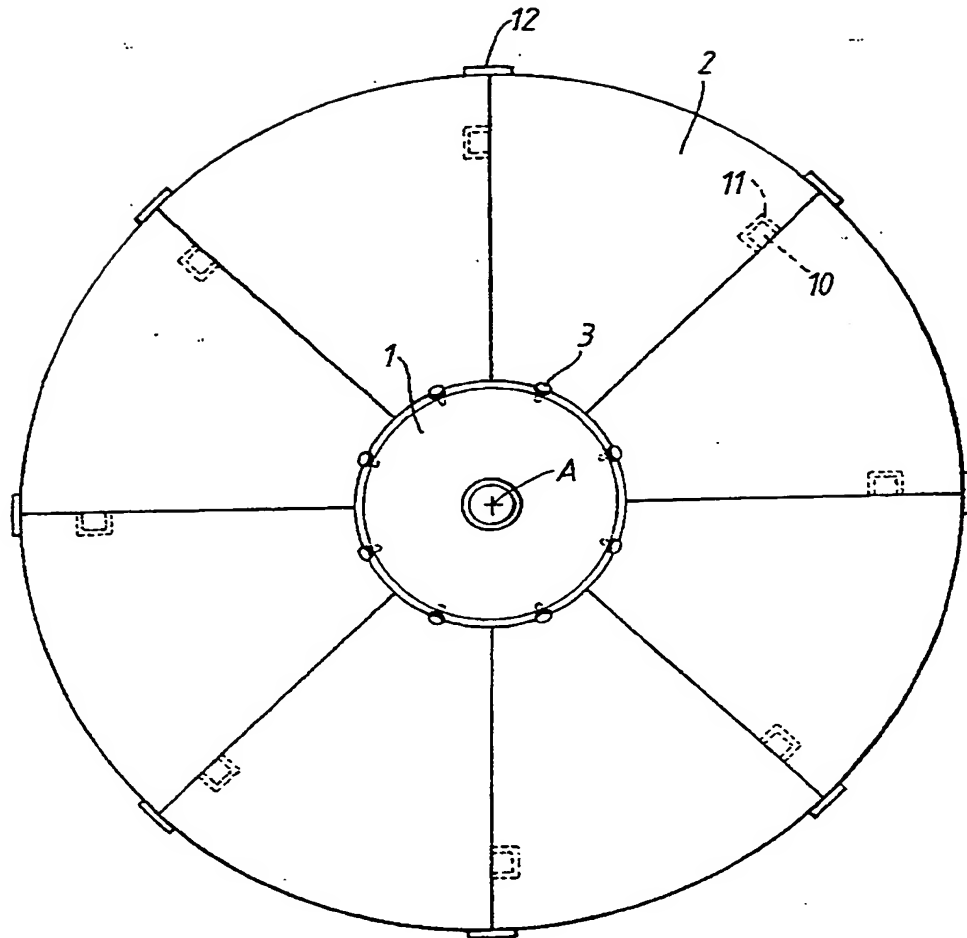


FIG. 2.